Two Postdoctoral Researchers in superconducting qubits and millikelvin electronics
Aalto University

Job Title	Two Postdoctoral Researchers in superconducting qubits and millikelvin electronics
Department	T304 Dept. Applied Physics
Institution	Aalto University , , Finland
Date Posted	Jun. 27, 2025
Application Deadline	Open until filled
Position Start Date	Available immediately
Job Categories	Post-Doc
Academic Field(s)	Physics - General
Job Website	https://aalto.wd3.myworkdayjobs.com/aalto/job/Otaniemi-Espoo-Finland/Two-Postdoctoral-Researchers-in-superconducting-qubits-and-millikelvin-electronics_R43669-1
Apply By Email	

Job Description

Aalto University is where science and art meet technology and business. We shape a sustainable future by making research breakthroughs in and across our disciplines, sparking the game changers of tomorrow and creating novel solutions to major global challenges. Our community is made up of 120 nationalities, 14 000 students, 400 professors and close to 5000 faculty and staff working on our dynamic campus in Espoo, Greater Helsinki, Finland. Diversity is part of who we are, and we actively work to ensure our community’s diversity and inclusiveness. This is why we warmly encourage qualified candidates from all backgrounds to join our community.

At the Department of Applied Physics, our pioneering research in physical sciences creates important industrial applications that hold great technological potential. Our research focuses on Materials

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physics, Quantum technology, Soft & living matter, and Advanced energy solutions. Topics extend from fundamental research to important applications. We educate future generations of research and development professionals, data specialists, technology experts, inventors, and scientists for industry and society.

We are now looking for

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Did you recently get your PhD in circuit quantum electrodynamics (cQED) and are now looking into taking the full potential of your skills into use for making new scientific discoveries?

We are now looking for two Postdoctoral Researchers to join our development of improved superconduting qubits and millikelvin electronics which will be integrated to form an autonomous superconducting quantum processor at Aalto University’s Quantum Coputing and Devices (QCD) group at the Department of Applied Physics. In this position you have a chance to make history by demonstrating some of the first experiments of the future quantum-computer technology that is orders of magnitude more efficient than existing quantum processors. Join us in shaping the future!

As a result of five ERC grants, at QCD Labs, we have recently developed the [url=https://arxiv.org/abs/2407.18778]most coherent transmon qubits, the [url=https://www.nature.com/articles/s41586-020-2753-3]lowest-noise bolometers and highest-resolution calorimeters, and shown that they can be used to [url=https://www.nature.com/articles/s41928-024-01147-7]read out the state of a transmon qubit at millikelvin temperatures. In addition, we have demonstrated [url=https://www.nature.com/articles/s41928-021-00680-z]millikelvin components for generating coherent microwave drive pulses and [url=https://www.nature.com/articles/ncomms15189]reset of qubits. Thus as a doctor in cQED you have an ideal opportunity to utilize your skills and vast ability learn new physics on these components, build new improved circuits, and finally put them together for millikelvin feedback. This new research direction initiated by Prof. Mikko Möttönen is currently funded by Jane and Aatos Erkko Foundation.

Your role and goals
You are expected to carry out research on the scientific steps required for the development of the autonomous quantum processing unit (AQPU) as follows: * Carry out design, experiments, and/or data analysis on specific research topics that we consider most important for realizing the AQPU * Participate in meetings to discuss the AQPU plan together with the team * Help your peers in solving their challenges in reaching the milestones including the supervision of BSc theses and possibly of

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PhD and MSc theses * Create reporting data and provide it for tracking progress * Work together with our national and international collaborators

Your network and team
You will work in the QCD group as a Postdoctoral Researcher with Prof. Mikko Möttönen being your direct superior. The QCD group ([url=https://www.aalto.fi/en/department-of-applied-physics/quantum-computing-and-devices-qcd]https://www.aalto.fi/en/department-of-applied-physics/quantum-computing-and-devices-qcd) is one of the leading groups working on superconducting-quantum-computer science and the birth place of one of the world-leading companies building quantum computers, IQM Quantum Computers, along several other companies. You will work together with 20-40 other current group members that form a diverse and exceptionally high-quality team. With hundreds of QCD alumni, including six professors and five chief executives, and a wide range of national and international collaborators, we have an indeal network we can utilize in building the AQPU. Importantly, VTT is integrated in the project.

Your experience and ambitions
We are looking for exceptional scientists with the following experience and skills: * PhD in the field cQED needs to be submitted for evaluation before starting the job * Proven excellence on more than five of the following pieces of skills: * Quantum-mechanical model of microwave circuits * Electromagnetic modeling of microwave circuits * CAD design of microwave circuits * Room temperature and cryogenic measurement setups for microwave circuits * Execution and data acquisition from measurements of quantum microwave circuits * Data analysis * Writing scientific manuscript on quantum microwaves * Sample fabrication * Impressive publication record showing high potential for progressing in the academic career * Fluency in English (Finnish language is not needed) * Good team working and thesis instruction skills are beneficial for the position * Ambition for high-impact scientific results * Ability to efficiently produce scientific results * Team spirit to make the team succeed as a whole

With this experience and skills and with our great team and plans, you are able to joint us in setting the phase of how quantum computers will be build in the 2030’s!

What we offer * Full-time position for a 3-year fixed-term period (Shorter contract negotiable) * World-leading laboratory. We have five modern dilution refrigerators, measurement electronics and software, and fabrication processes all in place to achieve top scientific results without the need to build tools for years. * Responsible and meaningful role with great impact in the development of quantum computers, and hence, in the wellbeing and development of our society. * Ideal starting point and team. We have already secured major long-term funding for this effort and have many talented researchers pursuing these goals to make you succeed. * Inspiring environment. We are proud of our purpose to shape the

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future. We spark the gamechangers of tomorrow, and renew the society with research-based knowledge, creativity and an entrepreneurial mindset. * Inclusive culture fostering equality. All our work is guided by our Aalto and Nordic values such as inclusiveness, responsibility, courage, collaboration, and equality as a way of life. The people create QCD, now and in the future. We are an open diverse community where equality and inclusion enable curiosity, innovation, collaboration and wellbeing. * Support, coaching and sparring when you feel you need it. * Great possibilities for competence development and learning. We constantly keep learning to find the most impactful ways to empower—and invest in—our people.

Our vast array of professional development opportunities means you will grow and learn, having the chance to participate actively in staff trainings and development projects based on your interests and needs. The salary range for this position is approximately 4138-4549 €/month. We value results with work-life balance and well-being in all aspects of life. The primary workplace is located at the Otaniemi Campus in Espoo, Finland, while remote work is possible when it serves the purpose. Life on the revitalized campus is vibrant, featuring stunning architecture, tranquil nature, and a variety of cafes, restaurants, and services, all complemented by excellent public transportation connections.

Join us!
To apply, please share your CV and motivation letter with us through our recruitment site (click the "Apply” button) as soon as possible but latest at 23.59pm (EET) 28th July 2025.

Please note: Aalto University’s employees should apply for the position via our internal HR system Workday (Internal Jobs) by using their existing Workday user account (not via the external webpage for open positions). If you are a student or visitor at Aalto University, please apply with your personal email address (not aalto.fi) via [url=https://www.aalto.fi/en/careers-at-aalto]Aalto University open positions

For more information about the role, please contact Prof. Mikko Möttönen +358 505 940 950 on 3rd July 2025 at 14:00 (EET). For questions related to the application process, please contact HR Advisor Minni Forss minni.forss(at)aalto.fi (out of office on 12.7.-3.8.2025).

We will go through applications, and we may invite suitable candidates to interview already during the application period. You should hear from us at the latest on the second week of August. We aim to have a transparent and equal recruitment process, so feel free to ask us for feedback.

Want to know more about us and your future colleagues? You can visit the [url=https://www.aalto.fi/en/department-of-applied-physics/qcd-cinema]QCD Chinema and watch these videos:
[url=https://www.youtube.com/watch?v=i8zawpNMVG8]This is Aalto University!

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[url=https://www.youtube.com/watch?v=5k_og_6zUJQ]Aalto University - Towards a better world and [url=https://www.youtube.com/watch?v=ZK6pDWm1_CE]Shaping a Sustainable Future.

Read more about working at Aalto: [url=https://www.aalto.fi/en/careers-at-aalto]https://www.aalto.fi/en/careers-at-aalto
Check out our new virtual campus experience: [url=https://virtualtour.aalto.fi]https://virtualtour.aalto.fi

About Finland
Finland is a great place for living with or without family - it is a safe, politically stable and well-organized Nordic society. Finland is consistently ranked high in quality of life and was listed again as the happiest country in the world: [url=https://worldhappiness.report/news/world-happiness-report-2025-people-are-much-kinder-than-we-expect-research-shows/]World Happiness Report 2025
For more information about living in Finland: [url=https://www.aalto.fi/en/careers-at-aalto/for-international-staff]Aalto Careers for International Staff.

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact

Finland